

WHAT IS CLAIMED IS:

Sub B1 ~~1. A method of monitoring an area, comprising the steps of:~~

~~periodically detecting an image of the area;~~

~~5 identifying and tracking a moving object in a succession of the detected images;~~

~~automatically selecting an image of each identified object using selection criteria; and~~

~~saving the selected image of each identified object.~~

10 2. A method according to Claim 1, including the steps of:

~~saving one of the detected images as a reference image;~~

~~15 carrying out said step of identifying by evaluating images detected subsequent to the reference image in order to identify therein each change region where the evaluated image differs from the reference image; and~~

~~carrying out said step of tracking by tracing movement~~

20 of each change region in successive evaluated images.

25 3. A method according to Claim 1, wherein said step of automatically selecting is carried out by using image selection criteria which are intended to lead to the selection of an image in which the face of a detected person is visible and large.

4. A method according to Claim 3, wherein said step of automatically selecting includes the steps of:

5 saving one of the detected images as a reference image;

carrying out said step of identifying by evaluating images detected subsequent to the reference image in order to identify therein each change region where the evaluated image differs from the reference image;

10 determining a bounding box for a given change region in each image of a set of images in which the given change region appears; and

15 selecting the selected image for the given change region by discarding images from the set in which a lowermost side of the bounding box is higher than in other images of the set, and by selecting from the remaining images of the set an image in which a size of the bounding box is larger than in the other remaining images of the set.

20 5. A method according to Claim 1, wherein said step of automatically selecting is carried out using image selection criteria which cause a current image to be selected over a prior image if a lowermost point of a detected change region is lower in the current image than in the prior image.

30 6. A method according to Claim 5, wherein said step of automatically selecting is carried out using image selection criteria which cause a current image to be selected over a prior image if a detected change region has increased in size relative to a prior image.

35 7. A method according to Claim 1, wherein said selecting step is carried out in response to the occurrence of a predefined event.

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8. A method according to Claim 7, wherein said predefined event includes detection of a previously undetected object.

5 Sub C1 9. A method according to Claim 7, wherein said predefined event includes detection of the absence of a previously detected object.

10 10. A method according to Claim 7, wherein said predefined event includes detection of a situation in which an object has remained within a predefined region of the area for a specified time interval.

15 11. A method according to Claim 7, wherein said predefined event includes a determination that a previously moving object has become stationary.

20 12. A method according to Claim 7, wherein said predefined event includes a determination a previously stationary object has started moving.

25 13. A method according to Claim 7, wherein said predefined event includes a determination of whether a detected object is a person.

14. A method according to Claim 13, wherein said predefined event further includes, for a detected object which is not a person, classification of the detected object into one of a plurality of predetermined categories.

30 Sub B2 15. A method according to Claim 1, wherein said saving step is carried out by saving a portion of a detected image which includes the detected object.
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16. A method according to Claim 15, including the step of saving one of the detected images as a reference image at a first resolution, and wherein said step of saving the selected image is carried out by saving the selected image at a second resolution which is higher than the first resolution.

10 17. A method according to Claim 1, including the step of saving one of the detected images as a reference image having a first resolution, wherein said step of saving the selected image is carried out by saving at a second resolution a portion of a detected image which includes the detected change region, the second resolution being greater than the first resolution, and including the step of displaying the reference image at the first resolution, displaying the selected image within the reference image at the first resolution, and displaying the selected image separately from the reference image and at the second resolution.

15 20 25 18. A method according to Claim 1, wherein said step of saving the selected image includes the step of saving an indication of a time associated with detection of the object in the selected image.

5 19. A method according to Claim 1, wherein said step
of saving the selected image includes the step of saving an
indication of a time associated with detection of the
object in the selected image; and including the step of
providing operator access to the saved time information and
image information.

10 20. A method according to Claim 1, including the step
of periodically saving a new reference image, wherein said
step of saving the selected image includes the step of
saving an identification of a respective one of the
reference images which was in effect when the selected
image was generated.

15 21. A method according to Claim 20, including the
step of detecting a condition in which successive detected
images are substantially identical for a predetermined time
interval, and responding to detection of said condition by
20 effecting said step of saving a new reference image.

Sub B3

22. An apparatus for monitoring an area, comprising:
a detector which is operative to periodically detect
an image of the area; and

5 an image processing section which is responsive to the
detector, said image processing section being operative to:
identify and track a moving object in a succession of
the detected images;
automatically select an image of each identified
object utilizing selection criteria; and
10 save the selected image of each identified object.

15 23. An apparatus according to Claim 22, including a
network interface circuit which is operative to interface
said image processing section to a network in order to
facilitate access to the saved image from a remote
location.

20 24. An apparatus according to Claim 23, including a
camera housing having therein a video camera which includes
said detector, and having therein said image processing
section and said network interface circuit.

SubB4

25. A method of monitoring an area, comprising the
steps of:

5 periodically detecting an image of the area;
 identifying and tracking a moving object in a
succession of the detected images; and
 automatically saving information which identifies the
path of movement of the object, said information being
retained after the object is no longer present in newly
10 detected images.

26. A method according to Claim 25, including the
steps of saving one of the detected images of the area,
15 displaying the detected image which was saved, and
displaying on the displayed image the path of movement of
the object.

27. A method according to Claim 25, including the
steps of saving an identification of an event associated
20 with the detected object, saving one of the detected
images, displaying the detected image which was saved,
displaying on the displayed image the path of movement of
the object, and displaying on the displayed image the
identification of the event.

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28. A method according to Claim 25, wherein said step
of automatically saving is carried out by storing a series
of Cartesian coordinate pairs, each Cartesian coordinate
30 pair identifying a location within a respective one of the
detected images.

Sub B5

29. An apparatus for monitoring an area, comprising:
a detector which is operative to periodically detect
an image of the area; and

5 an image processing section which is responsive to the
detector and which is operative to:

identify and track a moving object in a succession of
the detected images; and

10 automatically save information which identifies the
path of movement of the object, and to retain the
information after the object ceases to be present in
current detected images.

15 30. An apparatus according to Claim 29, wherein the
image processing section is operative to save one of the
detected images, and including a display portion coupled to
said image processing section and operative to display the
detected image which was saved and to display on the
displayed image the path and movement of the object.

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31. A method of monitoring an area, comprising the steps of:

detecting successive images of the monitored area;
5 evaluating the detected images in order to identify events of interest in the monitored area;

selecting and saving, for each event of interest, image information from the detected images;

10 saving identifying information for each event of interest;

presenting a list of the saved identifying information to a user;

15 permitting the user to select the identifying information corresponding to one of the events of interest; and

displaying for the user the saved image information for the event of interest that corresponds to the selected identifying information.

20 32. A method according to Claim 31, wherein the identifying information for each event of interest specifies a point in time at which that event of interest occurred.

25 33. A method according to Claim 31, wherein said step of saving the image information is carried out by saving the image information for each event of interest in a respective one of a plurality of first files stored in a computer memory; and wherein said step of saving the identifying information is carried out by saving the identifying information for all of the events of interest 30 in a second file stored in the computer memory

34. A method according to Claim 31, wherein said step
of saving the image information is carried out by saving
the image information for each event of interest in a
5 respective one of a plurality of first files stored in a
computer memory; wherein said step of saving the
identifying information is carried out by saving the
identifying information for all of the events of interest
in a second file stored in the computer memory; and wherein
10 said steps of presenting and displaying are carried out by
providing in the computer memory a third file which is in
hypertext markup language format, which can access and
present the identifying information in the first files, and
which can access and display the image information from a
15 selected one of the second files.

35. A method according to Claim 31,
wherein said step of saving the image information is
carried out by saving the image information for each event
20 of interest in a respective one of a plurality of first
files stored in a computer memory, where first and second
groups of the first files which respectively correspond to
events of interest occurring on first and second different
days are respectively stored in first and second
25 directories; and

wherein said step of saving the identifying
information is carried out by saving the identifying
information for all of the events of interest which
occurred on the first day in a second file stored in the
first directory, and by saving the identifying information
30 for all of the events of interest which occurred on the
second day in a third file stored in the second directory
in the computer memory.

36. A method according to Claim 31,
wherein said step of saving the image information is
carried out by saving the image information for each event
of interest in a respective one of a plurality of first
files stored in a computer memory, where first and second
groups of the first files which respectively correspond to
events of interest occurring on first and second different
days are respectively stored in first and second
directories;

wherein said step of saving the identifying
information is carried out by saving the identifying
information for all of the events of interest which
occurred on the first day in a second file stored in the
first directory, and by saving the identifying information
for all of the events of interest which occurred on the
second day in a third file stored in the second directory
in the computer memory; and

wherein said steps of presenting and displaying are
carried out by providing fourth and fifth files which are
respectively in the first and second directories, which are
each in hypertext markup language format, which can each
access and present the identifying information in the first
files in the same directory therewith, and which can each
display the image information from one of the second files
located in the same directory therewith.

37. A method according to Claim 36, wherein said
steps of presenting and displaying are carried out by
providing a sixth file which is in a third directory, which
is in hypertext markup language format, and which can
interact with each of the fourth and fifth files, the first
and second directories being subdirectories of the third
directory.

38. A method according to Claim 31,
wherein said step of saving the image information is
carried out by saving the image information for each event
5 of interest in a respective one of a plurality of first
files stored in a computer memory;

10 wherein said step of saving the identifying
information is carried out by saving the identifying
information for all of the events of interest in a second
file stored in the computer memory;

15 wherein said step of evaluating is carried out by
periodically saving a detected image in the computer memory
in a respective third file as a reference image, and by
comparing currently detected images to a current reference
image which is the most recently saved reference image; and

20 wherein said step of selecting and saving is carried
out by saving a portion of a current image which differs
from the current reference image, each of the first files
including an identification of the reference image which
was in effect when the image information therein was saved.

25 39. A method according to Claim 25, wherein said step
of saving the reference images is carried out by providing
in a first directory a first group of the third files which
all correspond to reference images saved on a first day,
and by providing in a second directory a second group of
the third files which all correspond to reference images
saved on a second day.

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